

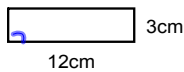
Ch 11 Area

11.1 Area of Parallelograms
 11.2 Area of Triangles, Trapezoids,
 and Rhombi

Area of a rectangle = bh $b \perp h$ Area of a square = s^2 Area of a parallelogram = bh 

* Base and height are perpendicular

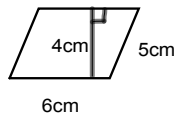
Example 1



$$A = 12 \cdot 3$$

$$36 \text{ cm}^2$$

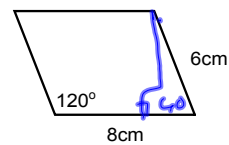
Example 2



$$A = 4 \cdot 6$$

$$24 \text{ cm}^2$$

Example 3



$$A = 8 \cdot 3\sqrt{3}$$

$$= 24\sqrt{3} \text{ cm}^2$$

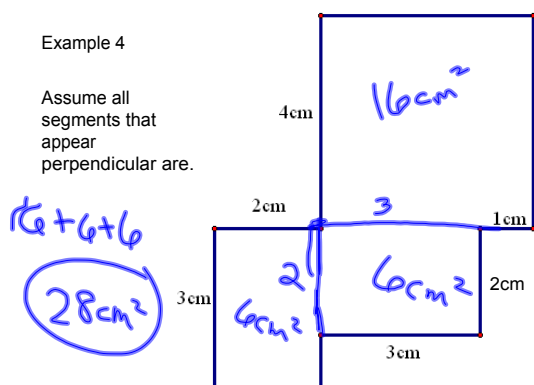


$$h = 3\sqrt{3}$$

$$\begin{array}{r|l} 30 & 60 \\ \hline 3 & 3\sqrt{3} \end{array} \quad \begin{array}{r|l} 90 & 6 \end{array}$$

Example 4

Assume all segments that appear perpendicular are.



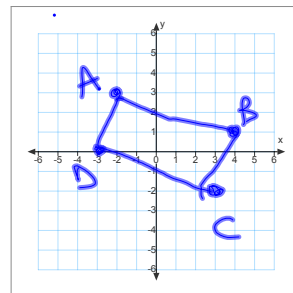
Example 5

A (-2, 3)

B (4, 1)

C (3, -2)

D (-3, 0)



Rect

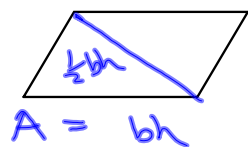
$$\overline{AB} \quad m = \frac{2}{6} = \frac{1}{3}$$

$$\overline{AD} \quad m = \frac{3}{1}$$

$$d = \sqrt{(-6)^2 + 2^2} = \sqrt{40}$$

$$d = \sqrt{1^2 + 3^2} = \sqrt{10}$$

$$A = \sqrt{40} \cdot \sqrt{10} = \sqrt{400} = 20 \text{ u}^2$$



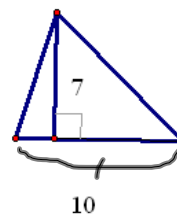
What is the area of this shape?
Cut it in half.

Area of a Triangle = $\frac{1}{2}bh$

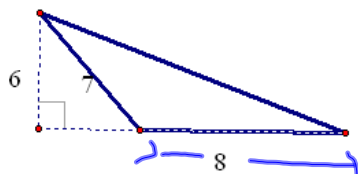
Example 1

$$A = \frac{1}{2} 7 \cdot 10$$

$$A = 35 \text{ u}^2$$



Exam



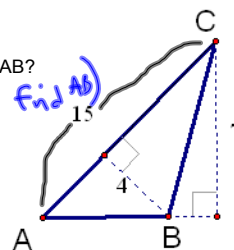
$$A = \frac{1}{2} \cdot 8 \cdot 6$$

$$24 \text{ u}^2$$

Example 3

What is the length of AB?

(Use area to find AB)



$$A = \frac{1}{2} \cdot 4 \cdot 5$$

$$A = 30 \text{ u}^2$$

$$A = \frac{1}{2} b h$$

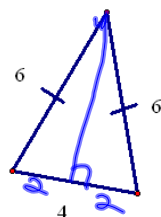
$$30 = \frac{1}{2} b \cdot 7$$

$$30 = 3.5 b$$

$$8.57 = b$$

Example 4

Use pyth. thm to find h.



$$6^2 = 2^2 + h^2$$

$$36 = 4 + h^2$$

$$32 = h^2$$

$$4\sqrt{2} = h$$

$$A = \frac{1}{2} b h$$

$$\frac{1}{2} \cdot 4 \cdot 4\sqrt{2}$$

$$A = 8\sqrt{2} \text{ u}^2$$

Example 5



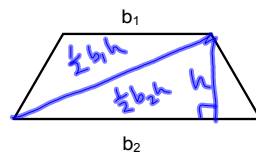
$$A = \frac{1}{2} \cdot 4\sqrt{3} \cdot 8$$

$$A = 16\sqrt{3} \text{ u}^2$$

$$\text{Area of an Equilateral Triangle} = \frac{s^2\sqrt{3}}{4}$$

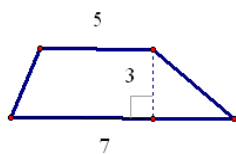
$$\frac{8^2\sqrt{3}}{4}$$

$$A = 16\sqrt{3} \text{ u}^2$$



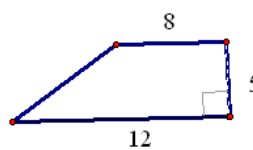
$$A = \frac{1}{2} b_1 h + \frac{1}{2} b_2 h$$

$$A = \frac{1}{2} h (b_1 + b_2)$$



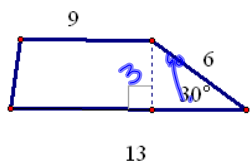
$$A = \frac{1}{2} 3(5+7)$$

$$A = 18 \text{ u}^2$$



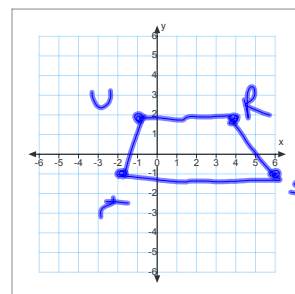
$$A = \frac{1}{2} 5(8+12)$$

$$A = 50 \text{ u}^2$$



$$A = \frac{1}{2} \cdot 3 \cdot (9+13) \\ = 33 \text{ u}^2$$

R(4, 2)
S(6, -1)
T(-2, -1)
U(-1, 2)



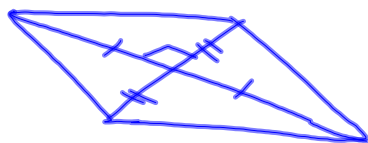
$$RU = 5$$

$$TS = 8$$

$$h = 3$$

$$A = \frac{1}{2} \cdot 3 \cdot (8+8) = 19.5 \text{ u}^2$$

Area of a Rhombus = $\frac{1}{2} d_1 \cdot d_2$



- diagonals \perp
- diagonals bisect each other
- diagonals bisect the angles

M(0, 1) MNPR is a rhombus

N(4, 2)

P(3, -2)

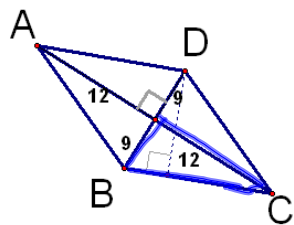
R(-1, -3)

$$A = \frac{1}{2} d_1 \cdot d_2$$

$$A = \frac{1}{2} \cdot 3\sqrt{2} \cdot 5\sqrt{2} \\ = \frac{1}{2} \cdot 15 \cdot 2 = 15$$

$$MP = \sqrt{\left(\frac{3-0}{2}\right)^2 + \left(\frac{-2-1}{2}\right)^2} = \sqrt{2} = \sqrt{2}$$

$$NR = \sqrt{\left(\frac{4-1}{2}\right)^2 + \left(\frac{2-3}{2}\right)^2} = \sqrt{5} = 5\sqrt{2}$$



What is the area of the rhombus?

$$A = \frac{1}{2} \cdot 24 \cdot 18$$

$$= \frac{1}{2} \cdot 216 \text{ u}^2$$

What is the height of the rhombus?

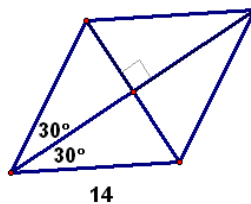
$$A = bh$$

$$216 = 15 \cdot h$$

$$14.4 \text{ u} = h$$

$$9^2 + 12^2 = h^2$$

$$15 = h$$



What is the area of the rhombus?

HW

p598 9-19odd

p606 13-21, 25, 27, 30, 32